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PLANETARY PHENOMENA FOR MARCH AND APRIL, 1918

By Malcolm McNeill

PHASES OF THE MOON, PACIFIC TIME

Last Quarter,	March 5,	$4^h\ 44^m$ P.M.	Last Quarter...	April 4,	$5^h\ 33^m$ A.M.
New Moon...	" 12,	11 52 A.M.	New Moon....	" 10,	8 34 P.M.
First Quarter.	" 19,	5 30 A.M.	First Quarter...	" 17,	8 8 P.M.
Full Moon...	" 27,	7 33 A.M.	Full Moon.....	" 26,	12 5 A.M.

The Sun crosses the celestial equator from south to north, and is, therefore, at the vernal equinox on March 21st, $2^h\ 26^m$ A. M., Pacific time.

Mercury on March 1st is a morning star, but too near the Sun for naked-eye observation. It comes to superior conjunction and becomes an evening star on March 12th. The distance between the two bodies increases quite rapidly, and greatest east elongation is reached on April 7th. The distance between Sun and planet is then 19° 17′, rather less than the average greatest elongation, since *Mercury* passed perihelion on March 27; but *Mercury* is 8° north of the Sun and this acts to increase the interval between sunset and the setting of the planet. On April 1st the interval is more than an hour and a half, and it does not diminish much until after the middle of the month. The last week in March and the first half of April, therefore, give the best opportunity of the year for naked-eye view of *Mercury*. After the middle of April the gap between Sun and planet diminishes rapidly and inferior conjunction is reached on April 27th.

Venus is a morning star and will remain so until nearly the end of November. Throughout the two months it rises a little less than two hours before sunrise, except for a few days near April 1st, when the interval is just over two hours. The apparent distance of the planet from the Sun increases up to April 20th, when greatest elongation, 46° 15′, is reached, but the relative motion of the planet from the Sun is southward as well as eastward, making the interval between the rising of the planet and of the Sun nearly constant. *Venus* again reaches its position of greatest brilliancy on March 16th, and will be visible to the naked eye in full daylight for some weeks before and after that date. In looking for it about that time the planet will be found about 38° east and 10° south of the Sun.

Mars will be, during March, in the best position for observation it has occupied since February, 1916. It reaches opposition on the night of March 14th, and its actual distance from the Earth is the least about three days later. At opposition it is above the horizon the entire night and at the end of April it remains above the horizon until 3 A. M. During the two months the planet moves about 15° westward and 4° northward from the eastern part of *Virgo* into *Leo*, the westward motion ceasing and eastward beginning on April 26th. *Mars* is at that time about 15° east and south of the first magnitude star *Regulus*, Alpha *Leonis*. During March the brightness of the planet remains nearly constant, being about three times as great as it was on January 1st, and about twelve times as great as it was when in conjunction with the Sun during the winter of the previous year. At conjunction it is about as bright as the pole star, so that at opposition it is far brighter than the average first magnitude star, even at an unfavorable one like the present.

The opposition brightness of *Mars* varies enormously according to the time of year at which it occurs. Winter oppositions occur when the planet is farthest from the Sun and summer oppositions when the planet is nearest the Sun. The fact that the Earth is nearer the Sun in winter than it is in summer also helps, but in a much less degree. At the present opposition the least distance between Earth and *Mars* is a little more than 61 million miles, but *Mars'* least distance from the Sun is 26 millions of miles less than its greatest distance; it will be near its least distance during the opposition of August, 1924, and its distance from the Earth will then be less than 35 millions of miles. The planet will then be three times as bright as it is at the present opposition. These favorable oppositions occur at intervals of fifteen or seventeen years. The average interval between oppositions is not quite two years and two months, but they vary in length more than forty days, the time between the present opposition and that of 1916 being 764 days, while that between the oppositions of 1922 and 1924, summer oppositions, will be 805 days.

Jupiter is still in good position for evening observation in the western sky. On March 1st it does not set until nearly 1 A. M., and at the end of April at about 9:30 P. M. It is in the constellation *Taurus* and moves about 11° eastward and 2° northward in the two months, passing about 6° northward of the first magnitude star *Aldebaran*, Alpha *Tauri*.

Saturn is also in good position, passing the meridian at about 10 P. M. on March 1st and four hours earlier on April 30th. It is in the constellation *Cancer* and moves slowly westward until April 9th, there during the rest of the month it moves a little eastward. The first magnitude star *Regulus* is not far from 15° east and south of *Saturn*, while *Mars* is on almost the same line east of the star.

Uranus is an early morning object increasing its apparent distance from the Sun, but still too near for early observation.

Neptune is near *Saturn* but too faint for naked-eye observation.